

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method for making a heating element adhered to a substrate, the method comprising:

applying a photocurable composition to a substrate in a pattern having one or more grid lines, the photocurable composition curable into an electrically conductive layer and having volatile organic compounds present in an amount of less than about 10% of the total weight of the photocurable composition, wherein the substrate comprises a plastic that is at least partially soluble in volatile organic compounds or softened by volatile organic compounds; and

illuminating the photocurable composition to light for a sufficient period of time to cure the photocurable composition that has been applied to the substrate.

2. (Original) The method of claim 1 wherein volatile organic compounds are present in an amount of less than about 5% of the total weight of the photocurable composition.

3. (Original) The method of claim 1 wherein volatile organic compounds are present in an amount of less than about 1% of the total weight of the photocurable composition.

4. (Cancelled)

5. (Original) The method of claim 1 wherein the pattern further includes one or more busbar from which the one or more gridlines extend.

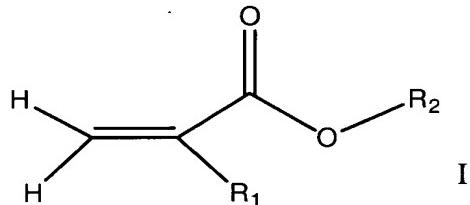
6. (Original) The method of claim 1 wherein the pattern comprises a first busbar and a second busbar wherein the one or more gridlines extend between and are in electrical contact with the first busbar and the second busbar.

7. (Original) The method of claim 1 wherein the photocurable composition comprises:

- a photocurable organic mixture;
- an electrically conductive composition; and
- a photoinitiator.

8. (Original) The method of claim 7 wherein the photocurable organic mixture comprises:

- one or more photocurable oligomers; and
- an ethylenically unsaturated monomer having Formula I:



wherein R₁ is hydrogen or substituted or unsubstituted alkyl; and R₂ is substituted or unsubstituted alkyl having more than 4 carbon atoms, cycloalkyl, cycloalkenyl, or substituted or unsubstituted aryl.

9. (Original) The method of claim 8 wherein R₁ is hydrogen or methyl, and R₂ is isoborynl, phenyl, benzyl, dicylcopentenyl, diclypentenyl oxyethyl, cyclohexyl, and naphthyl.

10. (Original) The method of claim 8 wherein the ethylenically unsaturated monomer is an isobornyl acrylate monomer.

11. (Original) The method of claim 8 wherein the one or more photocurable oligomers are selected from the group consisting of an aliphatic acrylated oligomers, an acrylated epoxy oligomers, and mixtures thereof.

12. (Original) The method of claim 7 wherein the photocurable composition comprises an aliphatic acrylated urethane oligomer and an acrylated epoxy oligomers.

13. (Original) The method of claim 7 wherein the electrically conductive composition comprises a component selected from the group consisting of silver, carbon black, a doped metal oxide, and mixtures thereof.

14. (Original) The method of claim 7 wherein the electrically conductive composition comprises silver powder and silver flakes in an amount of at least 20% relative to the weight of the silver powder.

15. (Currently Amended) The method in claim 7 wherein;

a) the photocurable organic mixture comprises:

an aliphatic acrylated urethane oligomer is present in an amount of about 3% to 8% of the total weight of the photocurable composition;

acrylated epoxy oligomer is present in an amount of about 2% to 4% of the total weight of the photocurable composition; and

an isobornyl acrylate monomer is present in an amount of about 4% to 8% of the total weight of the photocurable composition; and

b) the electrically conductive composition comprises:

silver powder is present in an amount of about 50% to 60% of the total weight of the photocurable composition; and

silver flakes are present in an amount of about 25% to 35% of the total weight of the photocurable composition.

16. (Original) The method of claim 15 wherein the photocurable composition further comprises a flow promoting agent.

17. (Original) The method of claim 15 wherein the electrical composition further includes a second conductive powder selected from the group consisting of carbon black and a doped metal oxide.

18. (Original) The method of claim 15 wherein the substrate is a flexible substrate.

19. (Currently Amended) A method for making a heating element adhered to a substrate, the method comprising:

a) applying a photocurable composition to substrate in a pattern having one or more grid lines, the photocurable composition comprising

an aliphatic acrylated urethane oligomer;

acrylated epoxy oligomer;

an isobornyl acrylate monomer;

silver powder;

silver flakes; and

a photoinitiator, wherein the photocurable composition has less than about 10 weight % volatile organic compounds and wherein the substrate comprises a plastic that are at least partially soluble in volatile organic compounds or softened by volatile organic compounds; and

b) illuminating the photocurable composition to light for a sufficient period of time to cure the photocurable composition that has been applied to the substrate.

20. (Original) The method of claim 19 wherein the silver flakes are present in an amount of at least 20% relative to the weight of the silver powder.

21. (Original) The method of claim 19 wherein, the aliphatic acrylated urethane oligomer is present in an amount of about 3% to 8% of the total weight of the photocurable composition;

the acrylated epoxy oligomer is present in an amount of about 2% to 4% of the total weight of the photocurable composition; and

the isobornyl acrylate monomer is present in an amount of about 4% to 8% of the total weight of the photocurable composition;

the silver powder is present in an amount of about 50% to 60% of the total weight of the photocurable composition; and

the silver flakes are present in an amount of about 25% to 35% of the total weight of the photocurable composition.

23. (Original) The method of claim 19 wherein the pattern further includes one or more busbars from which the one or more gridlines extend.

24. (Original) The method of claim 19 wherein the pattern comprises a first busbar and a second busbar wherein the one or more gridlines extend between and are in electrical contact with the first busbar and the second busbar.

25. (Original) The method of claim 19 wherein the substrate is a flexible substrate.

26-36. (Cancelled)

37. (New) A method for making a heating element adhered to a substrate, the method comprising:

applying a photocurable composition to a substrate in a pattern having one or more grid lines, the photocurable composition curable into an electrically conductive layer and having volatile organic compounds present in an amount of less than about 10% of the total weight of the photocurable composition;

illuminating the photocurable composition to light for a sufficient period of time to cure the photocurable composition that has been applied to the substrate; and

laminating a layer onto the substrate over the one or more gridlines, the layer including a plastic coating.

38. (New) The method of claim 37 wherein the coating is polyethylene or polypropylene.

39. (New) The method of claim 37 wherein the layer comprises a material selected from the group consisting of leather, cloth, foil, rigid or flexible plastics, polyester, polypropylene, polyethylene, PVC, metals, glass, paper, vinyl, wood, foam products, fiberglass, ABS, Kevlar, Lexan, scrim, woven and non-woven fabrics, rubber, cement, and painted surfaces.

40. (New) The method of claim 37 wherein volatile organic compounds are present in an amount of less than about 5% of the total weight of the photocurable composition.

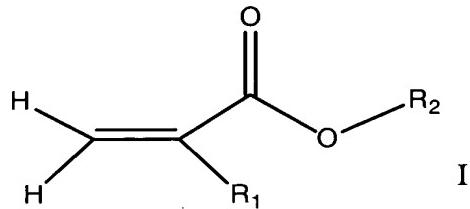
41. (New) The method of claim 37 wherein volatile organic compounds are present in an amount of less than about 1% of the total weight of the photocurable composition.

42. (New) The method of claim 37 wherein the photocurable composition comprises:

- a photocurable organic mixture;
- an electrically conductive composition; and
- a photoinitiator.

43. (New) The method of claim 42 wherein the photocurable organic mixture comprises:

one or more photocurable oligomers; and
an ethylenically unsaturated monomer having Formula I:



wherein R₁ is hydrogen or substituted or unsubstituted alkyl; and
R₂ is substituted or unsubstituted alkyl having more than 4 carbon atoms, cycloalkyl, cycloalkenyl, or substituted or unsubstituted aryl.

44. (New) The method of claim 43 wherein R₁ is hydrogen or methyl, and R₂ is isoborynl, phenyl, benzyl, dicyclopentenyl, diclypentenyl oxyethyl, cyclohexyl, and naphthyl.

45. (New) The method of claim 8 wherein the ethylenically unsaturated monomer is an isobornyl acrylate monomer.

46. (New) The method of claim 8 wherein the one or more photocurable oligomers are selected from the group consisting of an aliphatic acrylated oligomers, an acrylated epoxy oligomers, and mixtures thereof.

47. (New) The method of claim 7 wherein the photocurable composition comprises an aliphatic acrylated urethane oligomer and an acrylated epoxy oligomers.